

FCC 2nd ROOM

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Before the  
Federal Communications Commission  
Washington, D. C. 20554

In the Matter of	)	ET Docket No. 98-76
	)	
Amendment of Parts 2 and 15 of the	)	RM-9022
Commissions Rules to Further Ensure	)	
That Scanning Receivers Do Not	)	
Receive Cellular Radio Signals	)	
	)	

To: The Commission

REPLY COMMENTS OF Jacob Brodsky,  
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June 10, 1998

## Introduction

These are the comments of Jacob Brodsky, a radio amateur with over 20 years of experience, a graduate of the Johns Hopkins University with a degree in Electrical Engineering, a recreational experimenter with RF, and a practicing electrical engineer of radio telemetry systems.

## Overview

These comments will show why the efforts and concerns of this NPRM are impractical, ineffective, cumbersome, and should be ignored.

## Discussion

Judges, lawyers, and police frequently tell us that "ignorance is no excuse for the law." I'm writing this response because ignorance of science and technology is no excuse for bad laws, regulation, or policy. It cuts both ways. Nobody will take this proposed regulation seriously if our leaders keep making policy which looks as if it came from the Flat Earth Society. With this NPRM the Commission is getting dangerously close to that situation.

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Anyone with experience in radio technology understands that there is no such thing as radio privacy (the guaranteed absence of third party listeners). However, there can be radio secrecy (listeners bound by law not to divulge what they hear). Around the world, radio privacy is understood to be technically impossible to enforce. One would have to place a private citizen under so much surveillance to prove a violation of radio privacy that it would violate his/her human rights. Radio secrecy, on the other hand, is commonly the law of most democratic countries.

This is nothing new. Ever since the age of spark radio, it has been understood that if one wanted to keep a radio conversation private, that one had to use encryption, secret codes, or a combination thereof. Nothing in today's technologies has changed this paradigm.

Unfortunately, few in Congress seem to understand the distinction between radio secrecy and radio privacy. The result has been a very dangerous muddle of legislation. I see no benefit to having the Commission perpetuate this ignorance and foolishness any farther than required by Congress.

The first problem with this regulation is the definition of what exactly constitutes a "scanner." The definition of "a receiver capable of switching between four or more frequencies between 30 MHz and 960 MHz and capable of stopping at and receiving a signal detected on a frequency" ignores the possibility of a radio with a computer control interface but no memories of its own. Further, the definition is vague as to exactly what "switching" and "frequencies" means. What if there were some kind of fine tuning knob on a receiver? How many "frequencies" does it cover? How many "switches" can it do?

Most receivers in this frequency range have the capability of being controlled by computer. It is not difficult for individuals or small companies to build computer controllers which restore full scanning capabilities to a plain receiver. I doubt the FCC has the authority to ban various uses of computer equipment. So I fail to see exactly what the FCC can do to prevent "scanners" without affecting receivers which are not by definition "scanning receivers."

Second, what exactly is test equipment? I have used scanners to find IMD sources, sniff out a local oscillator frequency (to see if it was working), and I have even used the scanner's local oscillator as a makeshift signal generator. Admittedly, most scanner users won't go this far. However, my point is that a scanner can be a valuable piece of test equipment on my test bench. Were the scanner to include a calibrated signal strength display, it could easily be called a "selective level meter" or even a "poor-man's spectrum analyzer" when used with a computer.

So what features or performance specifications should one use to distinguish between test equipment and a consumer radio? The distinction is actually quite vague. This is especially the case because scanners are usually purchased by people who already have some

technical background. After all, it takes knowledge of the radio spectrum to know what numbers to punch in to a scanner.

Third, what kind of controls could one place on people who purchase unblocked receivers? Shouldn't a purchasing manager from a large company be able to buy one, even though s/he is not a licensed radio technician? What if the technician whose license might be used to purchase such equipment leaves the job? Where should the responsibility for the use of that equipment go to?

At the other end of the business spectrum, what about individuals like me? What if some day I were to start an RF engineering business from my shop at home. How would I, with an Engineering degree and my ham radio license, purchase unblocked test equipment? What basis could the FCC use to determine who can purchase such equipment and who can't?

I simply can't imagine criteria for the sale of unblocked receivers which could filter out trouble makers without affecting legitimate users. I don't think there is an equitable, non-intrusive solution.

Fourth, prevention of scanner modification is not easily defined. What exactly constitutes "readily being modified?" Keep in mind that many scanner enthusiasts are technically inclined.

The situation as it stands today is not all that bad. Once the cellular band blocking is "burned" in to a processor chip, so that modification is not possible without unsoldering and replacing the chip, most folks will give up on that approach. Instead, they'll seek other means.

Regulating kits is not the way to stop this behavior. It isn't hard for someone to sell downconverter kits intended for amateur use which could be easily modified for Cellular Telephone interception. Not only that, some kits can be pieced together to build a cellular receiver, despite their legitimate uses.

For example, there's nothing wrong with purchasing an R2 direct conversion receiver kit (a receiver capable of receiving many modulation modes, given the appropriate local oscillator and peripheral support) from Kanga US. And there's nothing wrong with building it for service at 45 MHz so that one can hook it up to a UHF TV tuner. Put them together, and what do you have?

The funny thing is that building kits is the hard way to receive cellular. Anyone who understands what a down-converter is knows that a common cable TV tuning box attached to the scanner will make scanning the cell phone bands a breeze. Just hook the cable side of the cable TV tuning box to an antenna and hook the TV side of the box to the scanner. Set the scanner to tune around TV channel 3 or channel 4, and...

The good news is this is not the problem it is made out to be. But for a very few high profile interception cases (the incident involving Speaker of the House, Newt Gingrich comes to mind), divulgence of intercepted transmissions is not a frequent occurrence.

Fifth, while it is true that there are test modes on some Cellular Telephones which can be used to listen in to conversations, very few individuals are likely to bother with the hassle of using these modes to listen in. It is cumbersome, after all, and there are far easier ways of listening to the cellular phone band. Besides, these self test modes do serve a purpose for manufacturing and maintenance personnel. And once again, what criteria could the FCC mandate to allow for testing, while at the same time prevent unauthorized use? It would not be wise for the Commission to get in to this kind of rule making.

Sixth, the interface to and from a radio (for the use with digital signal reception) should also be left alone. After all, with ham radio operators starting to use public domain paging protocols, and APRS packet standards over OSCAR satellite links, there are ample reasons why someone would want direct demodulator access to a scanning receiver. Is the FCC interested in regulating these features too?

The only thing in this proposal which might make sense is the image rejection standard. If Uniden wants to propose new image rejection standards of at least 38 dB for part 15, (as described in paragraph 6) I see very little wrong with that.

The Commission is going overboard in paragraph 7, however, by proposing that the whole radio be exposed to a certain field strength to verify total performance. Proper verification of this would require access to an Anechoic Chamber (to keep the test from radiating in to the outside world, if nothing else), whereas the proposal in paragraph 6 requires nothing more than the service monitor which would be used for alignment anyway.

If there are additional cellular telephone signals available to the scanner because of poor shielding, it probably won't be enough to warrant additional certification testing.

I believe regulations to pot the interior of a scanner to prevent modification is overkill. I've already pointed out that casual mischief makers are usually stopped cold by scanners which don't have mode configuration external to the microprocessor (such as a ROM chip, a diode, or a jumper). Keep in mind that simple and effective alternatives exist to modifying a scanner.

Besides, potting the scanner is not as cheap as it looks. Once an aligned board is potted, it often detunes. There could be a substantial quality control problem facing those who attempt this sort of measure.

I can't help getting the impression from the Commission as well as Congress that it isn't really scanners they're scared of. It's the users. To paraphrase that overused cliché, "Scanners don't disclose cellular telephone calls, people do." If there's a will, those with even a meager technical background can work around these ill-advised regulations. The Commission would do well to focus efforts toward prosecuting those offenders, such as the McDermott's (the couple who intercepted Newt Gingrich's conversation over a cellular telephone), who disclose what they hear.

## Conclusion

It's a proven fact of human nature that as soon as someone says "don't look at that naked lady riding her horse down the street" most people will turn and look. So what were our esteemed friends, the CTIA, thinking when they got Congress to legislate the cellular telephone bands as a "don't look" band? It was a foolish idea then, and it looks even worse now, particularly in the light of this NPRM.

I see many problems going forward with this line of regulation. As with many other kinds of radio equipment, scanners are a tool. Tools can be used for both good and evil. We don't legislate the manufacture of binoculars just because they might be used by Peeping Toms. Why should scanners be any different?

I don't think it wise for the FCC to attempt regulating what an individual's computer should and shouldn't be able to do with a radio. With commonly available alternatives and loopholes, I don't think the FCC will be particularly effective at regulating kits for down-conversion, or at telling cellular phone manufacturers what service modes they should or should not put in their phones. I doubt it would be an effective use of Commission resources to attempt setting minimum performance or construction standards for manufacturers. Once the Commission gets in to the business of regulating consumer receiver performance, I predict tremendous delays while the already understaffed FCC attempts to certify each and every change to a manufacturer's design. The probable delay on the part of the FCC outweighs any benefit to the public.

Frankly, though I dislike it, I can live with the status quo. However, I see no point in regulating how many nails to use for securing window shutters so that Lady Godiva can ride nude down a public street. Always remember, the story of Lady Godiva is legend precisely *because no-one looked!* Don't expect this every day from the general public, or you will be disappointed.

Sincerely,



Jacob Brodsky,  
Amateur Radio Station AB3A